REMARKS/ARGUMENT

Original claims 1-27 are pending.

New claims 30-61 are added.

Claims 28-29 are canceled.

Various ones of the original claims are amended herein to address different issues. For example, in claims 1 and 15, "said motion features" (no antecedent basis for such) was replaced with "at least one of a number and type of features" – and new dependent claims 30 and 31 were added that are specifically limited to the originally recited motion features.

In claims 13-14 and 26-27, the phrase "at least one of" was added to replace the former "one or more ... and/or any combination thereof" language.

Claims 2, 3, 7, 16 and 17 were amended only for purposes of clarification.

Claim 18 was amended to correctly recited the "second" mode instead of the "first" mode, which is consistent with claim 5 (the corresponding method version of claim 18).

Claim Objections

Claim 15 is amended to, inter alia, obviate the objection in regard to paragraph "c."

Claims 28-29 are canceled.

Claim Rejections under §102(b)

Claims 1-10, 13-23, and 26-29 are initially rejected as anticipated by Meyer et al. This rejection is respectfully traversed.

Meyer discloses image analysis and event detection performed at the camera location, by a "video sensor" described as a camera + detector + coder (see Figure 7, page 108). Meyer discloses a very simple (as compared to the present state of the art) motion detection algorithm executed by the aforesaid video sensor. The last paragraph of the Abstract in Meyer explains that:

> The detection and description of moving objects is based on an object-oriented, statistical multi-feature analysis of video sequences. This analysis is self-adapting to an observed scene, such that the calibration effort is very low. In case of an alarm event, object parameters are extracted and video images are memorized showing the history of the alarm event.

In contrast, the claimed invention relates to a "distributed image processing" method, in which feature extraction is separated from feature analysis across an IP network. As explained at page 10 of the present Application, about midway through the first full paragraph:

> MCIP is based upon the distribution of image processing algorithms between low-level feature extraction, which is performed by the encoders which are located in field (i.e., in the vicinity of a camera), and high-level processing applications, which are performed by a remote central server that collects and analyzes these features.

This concept is not disclosed or taught in Meyer. Instead, Meyer discloses that the entire analysis of the image stream (video signal) is carried out at the "video sensor" (i.e., camera/detector/coder). In Meyer, the video sensor (the in-field component) analyzes the video signal using a simple motion detection algorithm, detects events thereby, and then sends an alarm to the surveillance center (e.g., a remote server) when an event is detected. As noted by the Examiner, Meyer also explains that images and additional information about the event are also transmitted to the surveillance center (third bullet in the "Conclusion" section on page 110).

However, Meyer is completely devoid of any disclosure or teaching that the "video sensor" only transmits a "feature stream" to the surveillance center, and that it is the surveillance center that detects events in the video signal by analyzing the feature stream. In contrast, at page 108, in reference to Figure 7, Meyer states:

> The video signal is evaluated at the location of the camera. In case of an alarm event images are transmitted from a sensor to the surveillance center via a network connection. (Emphasis added.)

Thus, it is clear that the surveillance center in Meyer does not perform any event detection. The Examiner states that the last paragraph of the Abstract, and Figure 7, disclose that the surveillance center "is capable of determining said threshold, and of processing said feature stream."

Respectfully, neither the Abstract, nor Figure 7, nor the description of Figure 7 on page 108 (quoted above), provide support the proposition that the surveillance center performs "processing of said feature stream." The last paragraph of the Abstract is describing the operation of the "video sensor," not the surveillance center. Moreover, as quoted above, it is expressly stated in the last paragraph on page 107 that all of the video signal processing and event detection is performed entirely by the video sensor.

Thus, nothing in Meyer describes any video signal processing or event detection being carried out at the surveillance center. In fact, the whole focus of Meyer is performing the video signal evaluation and event detection at the camera, instead of at the surveillance center.

Meyer's video sensor system is described as an alternative to what he describes as the "conventional video surveillance center" (see Figure 6, described at page 108) wherein video signals from multiple cameras are transmitted to a remote surveillance center, and then the processing of the video signal and event detection are all performed at the surveillance center.

Meyer's alternative, shown in Figure 7, and described at page 108, as quoted above, is a "video sensor" system-- wherein the video sensor (i.e., camera + detector + coder) performs all of the image processing, feature extraction, and event detection, at the location of the camera, and transmits alarms and video to the surveillance center only after an event is detected.

In contrast, Applicant's claims recite in-field cameras/encoders which only extract features and encode the features into a feature stream which is transmitted to a remote image processing server. The claimed cameras/encoders do not perform event detection. Instead, the remote server analyzes the feature streams and detects events therefrom. The remote server then controls the particular cameras/encoders at which events are detected to also transmit, in addition to the feature stream, the image stream.

The claims are thus distinct both from Meyer's video sensor system in Figure 7, and the "conventional system" of Figure 6. Meyer's video sensor system performs the image processing, feature extraction, and event detection at the camera/detector/coder. In contrast, as described by Meyer, the "conventional system" performs the image processing, feature extraction, and event detection at the remote surveillance center. In contrast to both of these systems, the present claims recite a distributed image processing system in which low level feature extraction is performed at the cameras/encoders, and high level image processing and event detection is performed by a remote server. The advantages of the claimed system are set forth in the present patent application.

Some disadvantages of Meyer's "conventional system" are described in that article. One obvious disadvantage of Meyer's video sensor system is that the camera/detector/coder does not have sufficient processing capability to perform image analysis other than the relatively simple motion detection algorithm. More sophisticated image processing techniques would require

more processing capability, such as can be provided by a remote image processing server, as described by the Applicant.

More sophisticated image processing capability could possibly be built into Meyer's "video sensors," but this would likely prohibitively increase the cost of each "video sensor," making such a solution impractical. Moreover, such a solution is also unnecessary in light of the Applicant's invention, in which only minimal processing capability, and minimal added cost, is required at each camera/encoder in order to simply extract features and generate the reduced bandwidth feature stream. Applicant's reduced bandwidth feature stream is then transmitted to the remote server which has the high level image processing capability, thus avoiding the disadvantages associated with the "conventional system" of transmitting the high bandwidth video streams from each camera to a remote surveillance center. As claimed, and as described in the present application, the high-level image processing functions can be more efficiently, and more cost effectively, performed at a single remote image processing server for a multitude of cameras/encoders.

Each of the independent claims (both amended and new claims) provide that the camera/encoders only extract features and generate a feature stream which is sent to a remote image processing server. The cameras/encoders do not perform event detection. Instead, the remote server analyzes the feature stream and performs the event detection therefrom. Further claims require, upon such detection, that the server to cause the cameras/encoders to additionally transmit an image stream. In this regard, the surveillance center in Meyer does not determine any thresholds. Meyer clearly describes that all feature extraction and event detection is performed entirely by the camera/detector/coder. Meyer is entirely silent on any image processing functions being performed at the surveillance center.

With respect to claim 3, the Examiner refers to the last sentence on page 108 of Meyer for the proposition that "all cameras in Meyers are controlled by the surveillance center," as support for the conclusion that this statement thus anticipates controlling the claimed image processing devices to operate in the recited first and second modes. Applicant respectfully disagrees with this interpretation. Meyer expressly states that evaluation of the video signal is carried out by the video sensor. Meyer does not mention anywhere that any image processing functions are performed at the surveillance center.

Therefore, any argument that the surveillance center performs any image processing of the video signal would seem to be speculative. The portion of Meyer referred to is more likely an indication of a more conventional, generic type of control over the cameras, e.g., controlling the camera position/direction, controlling the camera to send images even if no event is detected, turning the camera on/off, and the like. Nothing in Meyer indicates that any "event detection" related functions of the camera/detector/coder are controlled by the surveillance center.

The motion detection algorithm is clearly performed by the video sensor alone. No threshold determinations are described in Meyer as being determined by the surveillance center, nor is any type of image processing mentioned or suggested as being performed at the surveillance center. The only description in Meyer about "thresholds" is in the context of the motion algorithm, and this is carried out solely by the video sensor, not the surveillance center.

With respect to the rejection of claim 6, Figure 7 of Meyer does not disclose "dynamically allocating additional image processing resources ... to data communication channels that receive image streams." Figure 7 shows only multiple channels. The Examiner's characterization is respectfully traversed, because, for one thing, the surveillance center in Meyer does not even perform any "image processing." All image processing is performed at the video sensor, as discussed above, and as expressly stated on page 108, in the description of Figure 7.

To summarize, Meyer does not disclose or teach, nor is it inherent therein, at least the following claim limitations:

- the camera/encoders do not analyze the image stream to perform the event detection, the camera/encoders only extract features and generate a feature stream which is sent to a remote image processing server for subsequent event detection;
- the remote server detects events by analyzing the feature stream;
- the remote image processing server controls the camera/encoder to transmit the video signal for detected events, in addition to the feature stream;
- the remote image processing server sets the threshold for the number and type of features to be encoded in the feature stream; and
- dynamically allocating additional image processing resources ... to data communication channels that receive image streams.

Each of amended, and new, independent claims 1, 15, 32 and 46 recite at least the first three limitations listed above. Therefore, claims 1-27 and 30-61 are patentable over Meyer.

Claim Rejections under §103(a)

Claims 11 and 24 are rejected under 35 U.S.C. 103(a) as obvious over Meyer and further in view of Wang et al. (US PN 6,266,369 B1).

Claims 11 and 24 depend from claims 1 and 15, and thus are patentable if claims 1 and 15 are patentable.

CONCLUSIONS

Each of the amended and new independent claims 1, 15, 32 and 46 recite at least the following limitations:

- the camera/encoders do not analyze the image stream to perform the event detection, the camera/encoders only extract features and generate a feature stream which is sent to a remote image processing server for subsequent event detection;
- the remote server detects events by analyzing the feature stream;
- the remote image processing server controls the camera/encoder to transmit the video signal for detected events, in addition to the feature stream;

For all of the reasons discussed in detail above, Meyer does not disclose or teach, nor is it inherent therein, at least these limitations. Wang et al. also does not disclose at least these limitations.

Therefore, independent claims 1, 15, 32 and 46 (and hence claims 2-14, 16-27, 30-31, 33-45 and 47-61) are patentable over Meyer et al., and Wang et al., either individually or any combination thereof.

Accordingly, reconsideration and allowance of amended claims 1-27 and new claims 30-61 are respectfully requested.

Respectfully submitted,

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